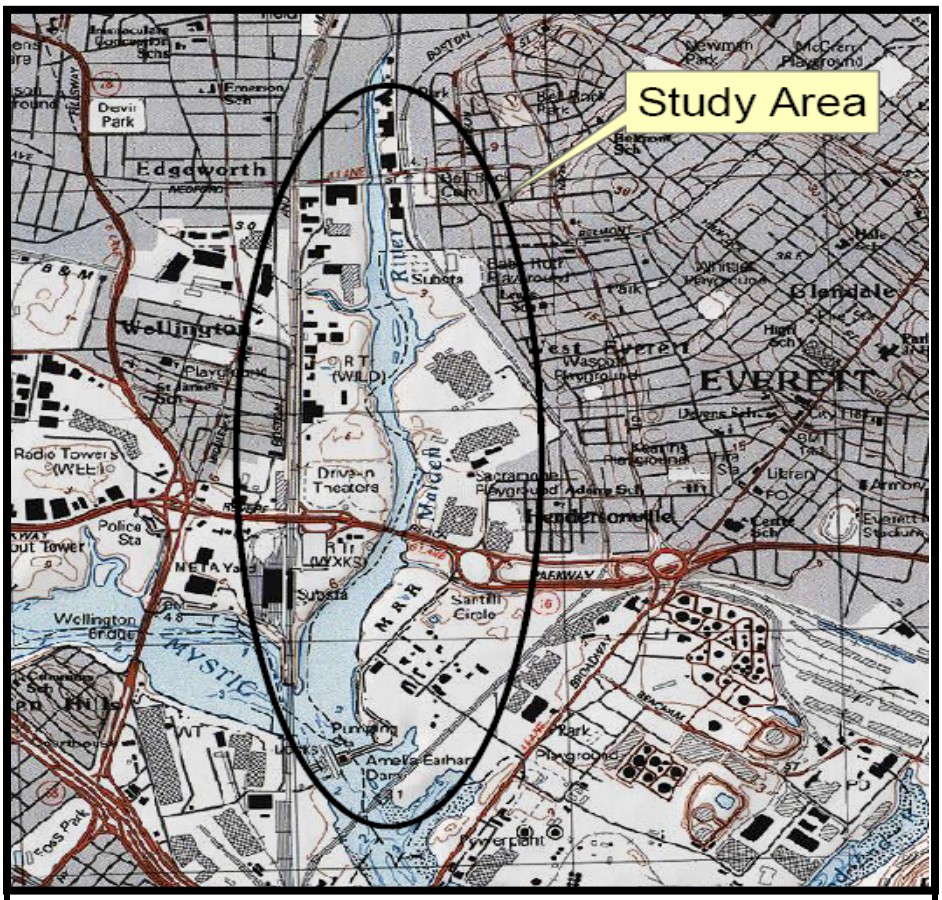
EXECUTIVE SUMMARY

The U.S. Army Corps of Engineers (USACE) in partnership with the Mystic Valley Development Commission (MVDC) developed this "Malden River Ecosystem Restoration Detailed Project Report and Environmental Assessment." Restoration of the Malden River ecosystem to the "highest quality that it can reasonably support and sustain" is the overriding project goal for MVDC and USACE. Numerous ecosystem restoration components were developed and evaluated as the building blocks for a comprehensive strategy designed to restore the environmental quality of the Malden River ecosystem. These measures are directed towards the three primary restoration objectives: wetlands restoration, aquatic habitat restoration and riverine migratory restoration. This Detailed Project Report presents, through a plan formulation process, a recommended National Ecosystem Restoration (NER) plan that reasonably maximizes environmental restoration benefits compared to costs and meets the project goals.

The Malden River is a degraded riverine ecosystem, where the surface water quality and underlying toxic sediments depress local fisheries and benthic communities. The bordering lands of the Malden River consist predominately of former tidelands bound by rail lines along each bank that were previously filled with razed building materials, industrial wastes and dredged material to support early industrial development. In their current condition, riverbank frontage has little ecological resource value. Riparian wetlands along the riverbanks are dominated by the exotic invasive wetland plant species, *Phragmites australis*, and the abundance and diversity of resident wildlife is limited.

The Malden River watershed, a Mystic River sub-basin, is approximately 11 square miles and is located in the towns of Wakefield, Stoneham, Melrose, Malden, Medford and Everett, Massachusetts. The Malden River originates from the outflow from Spot Pond in the Fells Reservation and passes beneath the cities of Melrose and Malden in channelized conveyances through much of the upper watershed. The river daylights from two sets of stormwater culverts south of Malden Center and flows for approximately 2 miles as open surface water through the densely populated cities of Malden, Everett and Medford prior to its confluence with the Mystic

River, just upstream of the Amelia Earhart Dam. The Study Area is defined where the river daylights from underground culverts in Malden to the confluence with the Mystic River with a lower downstream boundary at the Amelia Earhart Dam (see Figure ES-1).



Malden River Ecosystem Restoration Project
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Figure ES-1 U.S.G.S. Topographic

Habitat degradation along the Malden River has concerned public agencies since the 1970's. Numerous investigations by local, state, and federal agencies demonstrate a longstanding interest in the area and concerns about habitat degradation and deterioration of the river and its surrounding wetlands.

The primary elements of the recommended NER plan, depicted in Figure ES-2, were developed through the detailed evaluation of the Mystic/Malden River ecosystem characteristics. The elements are as follows:

- Removal of 36,000 cubic yards of invasive species along 14.9 acres of the riverbank corridor and replanting with native wetland plant species;
- Creation of 5.4 acres of emergent wetland within the existing oxbow;
- Placement of 4,400 cubic yards of gravel/sand substrate to create 2.8 acres of fish spawning habitat;
- Miscellaneous debris removal and disposal; and
- Operational changes at the Amelia Earhart Dam to improve fish passage for anadromous species.

Wetland restoration involves the removal of 14.9 acres of invasive species and replanting of native wetland species to create a freshwater emergent/shrub wetland. This recommendation consists of cutting, clearing and grubbing existing Phragmites stands, excavation of the Phragmites stubs and root matter, placing a layer of clean soil and the planting of native wetland seedlings. Phragmites stubs and root matter will be removed by excavating a minimum depth of 18 inches. The generated volume is estimated at 36,000 cubic yards. This excavated material will be used as a sub-base for the wetland creation component of the NER plan.

Wetland creation involves the establishment of a vegetated wetland within the river's oxbow to create 5.4 acres of emergent wetlands. This wetland creation component restores the historic area of marsh within the Malden River limits. Most of the excavated material from the wetland restoration component would be used as a substrate. A one foot layer of new soil would be placed prior to the planting of native wetland seedlings. The required volume of clean fill is estimated at 9,000 cubic yards. A flow control device such as a weir or flashboard riser would be installed within the existing tributary to control flow. The flow control device would diverse the flow and provide improve stormwater treatment.

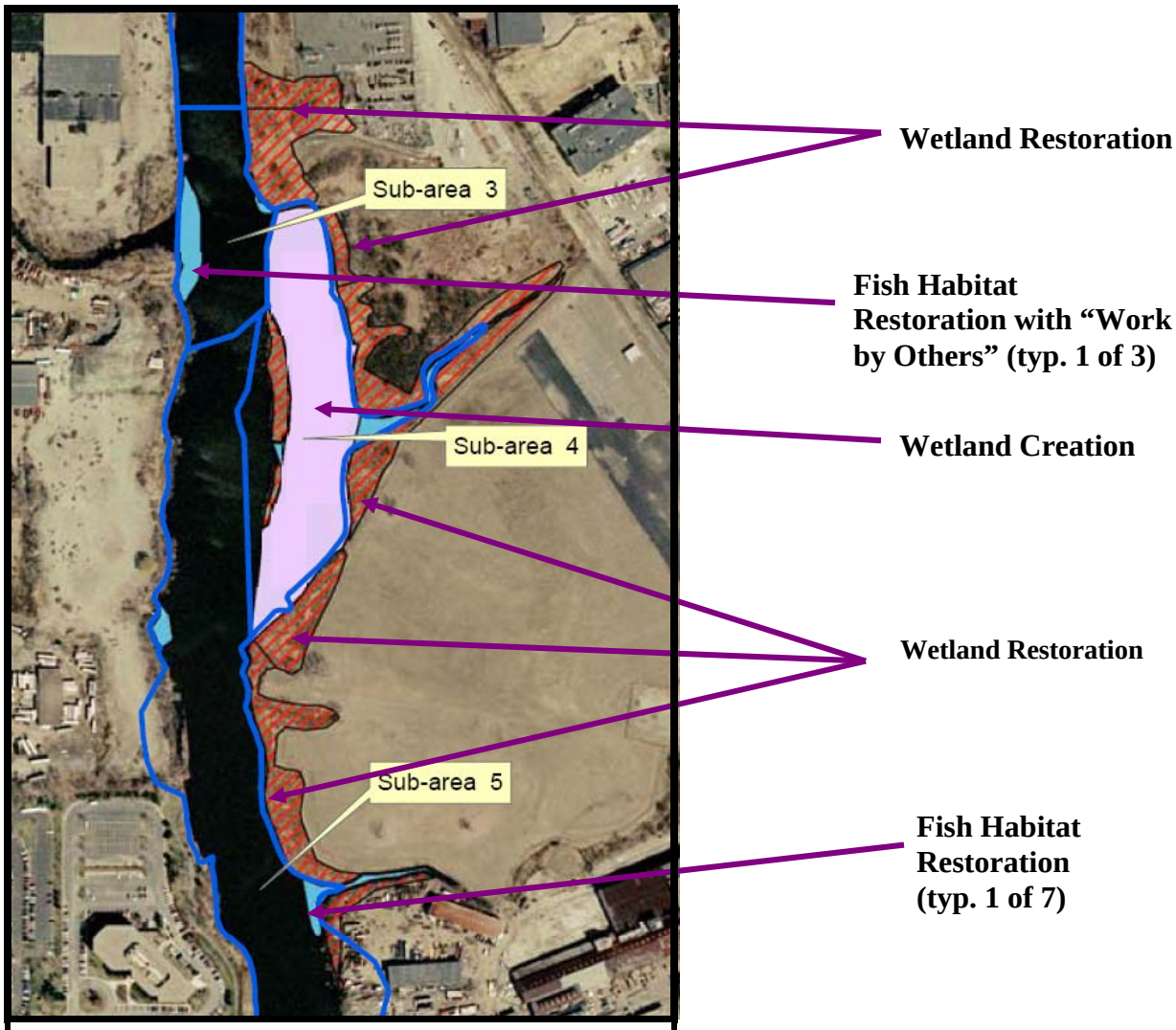

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Figure ES-2 Recommended NER Plan

Fish habitat restoration involves the placement 4,400 cubic yards of clean gravel/sand substrate to create 2.8 acres of fish spawning habitat. Three of the ten proposed areas require work by "others" before placement of the gravel substrate. Another party must remove/dispose a minimum of 3-foot depth of existing river bottom in order to provide a suitable and stable base prior to the placement of the proposed gravel substrate. Negotiations with the responsible parties are ongoing. Ten individual areas comprise the fish habitat restoration measure.

Miscellaneous debris removal and disposal is proposed within the construction work limits. This recommendation involves the removal of existing debris (e.g. shopping carts, tires, appliances…) and transporting to an upland disposal site. The generated volume is estimated at 450 tons. Cost for this proposed action will be non-Federal responsibility.

Fish Passage improvement involves operational changes to the Amelia Earhart Dam locking system. This recommendation consists of expanding the periods of operation of one or more of the locks to provide a more effective passage of fish. In particular, the operation would be modified to attain greater transfer of Atlantic rainbow smelt. This would require operating the locks not only during the daytime periods (which has proved reasonably effective for alewives), but also during evening and early morning hours during the smelt migration period.

The recommended NER Plan will result in a significant reduction in the current impacts to water and sediment quality, improve the riverine migratory corridor/spawning habitat and benthic community, restore the freshwater wetlands, and potentially increase public access and recreational use of the river. The NER plan will complement the enhancement of both ongoing and proposed work by MVDC/responsible parties to achieve along term sustainable restoration program for the Malden River.

Ecosystem restoration is one of the primary missions of the Corps of Engineers Civil Work program (ER 1165-2-501 – Civil Works Ecosystem Restoration Policy). The primary objective of Corps ecosystem restoration efforts is to partially or fully restore naturalistic, functioning, and self-regulating ecosystems. Restoration of wetlands, other aquatic systems, and riparian areas are most appropriate for Corps involvement. Corps restoration initiatives may also include measures to protect ecosystems from further degradation. Ecosystem restoration and protection initiatives should be conceived in the context of broader watershed management objectives, which may include collaboration with other federal and non-federal agencies, local communities, and other stakeholders, as in the case of the Malden River.

The aquatic habitat outputs from the separable elements of the NER plan represent resources of federal significance and institutionally recognized in the Clean Water Act (vegetated wetlands).

The additional benefits of forage and passage to spawning grounds for anadromous fish make restoration a critical Federal interest in this highly urbanized watershed. Federal interest in establishment and protection of anadromous fish is recognized in the Anadromous Fish Conservation Act and the Fish and Wildlife Conservation Act. Federal interest in invasive species control (*Phragmites*) is institutionally recognized by Executive Order 13112 of February 3, 1999 -- Invasive Species.

Corps planning guidance recommends description of technical significance in terms of one or more of the following ecological concepts: scarcity, status and trends, connectivity, critical habitat, and biodiversity.

- Scarcity: The coast of Massachusetts historically provided exceptionally productive fish and wildlife habitat through its numerous salt marshes and rivers. Over the last 300 years, these natural salt marshes and embayments have been degraded or lost through the development of transportation facilities and other coastal development. Restrict tidal flow, disposal of dredged sediment on the surface of the marshes, filling for business and residential development, and stormwater related sedimentation resulted in the loss of estuarine habitat and its associated values to fish and wildlife resources. In addition, the construction of dams and other structures along rivers and river channelization have prevented anadromous fish from accessing historic spawning and nursery habitat areas and have resulted in the loss of fish populations.

  The Malden River currently provides about 140 acres of degraded aquatic and wetland habitat in an otherwise heavily developed city landscape. The river is the only remaining resource in Malden that may provide significant aquatic and riparian habitat, including spawning habitat for anadromous fish. Other streams that once flowed freely in the area were culverted long ago and cannot be restored due to dense urbanization.

- Status and Trends: The Malden River system is a remnant of an extensive tidal wetland system, much of which was filled in during the 19th century. Past dredging

and filling activities has created small disconnected aquatic and wildlife habitats. These remaining habitats are currently highly degraded, and in decline due to proliferation of *Phragmites*, sedimentation, and continued contaminant loading. These areas do not function as a self-sustaining interconnected ecosystem. Without action, some conditions are expected to improve through the ongoing restoration efforts by others. The construction and current operations at the Amelia Earhart Dam has eliminated the historic fish runs throughout the Malden and Mystic River systems.

MVDC has promoted an ecosystem restoration approach to the Malden River corridor. Their goal is to restore and sustain the health, biological diversity and productivity of the river corridor. MVDC has begun integrating social and economic goals with ecosystem restoration efforts along the western riverbanks. MVDC's economic and ecosystem restoration initiatives consider interrelationships of aquatic and wetland habitats associated with disturbed and degraded ecosystem resources. MVDC is continuing their restoration efforts along the western side of the river corridor, which provides self-sustaining and functioning aquatic and wetland systems among a revitalized residential and employment community.

USEPA Brownfields Showcase Community designation of the Malden River corridor has involved numerous public and private entities, including the Malden Redevelopment Authority, Massachusetts Electric/National Grid, KeySpan, Tufts University, Exelon, ENSR, and Preotle Lane and Associates have joined MVDC and USEPA in addressing the systematic problems of the river system. These entities, as well as other riverfront property owners, watershed associations, and citizens of the three host communities, which number in excess of 140,000, share a common goal of restoring this long neglected Malden River corridor. Restoration efforts include remedial activities for Little Creek, high voltage cable relocation with sediment cleanup, Phase IV Remedy Implementation Plan (Mass Electric) and future site development for the General Electric property.

- Connectivity: The value of natural areas is enhanced by existence of habitat corridors that allow for movement and dispersal of native species between resource areas. Restoration alternatives that improve connectivity are considered technically significant. Restoration of in-stream, wetland and riparian habitat along the Malden River will be significant in providing a resting area (habitat island) for migratory songbirds passing through the highly urbanized Malden-Medford-Everett area. Restoration of the Malden River provides and essential link between freshwater and estuarine and marine habitats. Restoration of fish passage capacity will link anadromous fish to their historic spawning grounds.

- Critical Habitat: This is habitat that is essential for the conservation, survival, or recovery of one species listed as rare or endangered under the Federal Endangered Species Act or other significant federally interest species. The Malden and Mystic Rivers provide potential spawning habitat for the Blue-black Herring and possible spawning habitat for other anadromous species. Given the scarcity of anadromous fish spawning and rearing habitat in the greater Boston area, restoration of the Malden River is considered technically significant.

- Biodiversity: Restoration alternatives that improve biodiversity (either species richness or evenness) are considered technically significant. The NER plan would eradicate the monospecific stands of *Phragmites*, increasing the biodiversity (species richness) of emergent wetland and riparian communities. Removal of contaminated sediments would likely increase diversity of the benthic community, by increasing both the number of species and reducing the dominance of tubificid worms and oligiochaetes. Based on these criteria, restoration of the Malden River is considered technically significant.

The District Engineer recommends that the NER plan be authorized for implementation as a Federal project at an estimated total project cost of $7,344,000. As costs for environmental restoration projects are shared 65 percent Federal/ 35 percent non-Federal and implementing the maximum Federal limit, costs would be apportioned $4,773,600 Federal and $2,570,400 non-

Federal. The recommendation is also subject to the non-Federal sponsor assuming full responsibility for the project including all lands, easements, rights-of-ways, relocation and disposal areas (LERRDs). The non-Federal sponsor, Mystic Valley Development Commission, understands and agrees with these requirements, and is anxious to move forward with the recommended NER plan. Based on the scope and cost of the selected plan, the District Engineer recommends that implementation be pursued under the authority of ***Section 206 of the Water Resources Development Act of 1996 (PL 104-303).***

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